FIG. 1

OLAP	Geospatial Iceberg Cube
Definition: algorithm + data structures = program	Definition: algorithm + data structures = autonomic program
Composed of: matrix	spatial cube
record	data point, line, or polygon
bitmap	spatial objects
Solves problems that are unknown	Solves problems which are known or anticipated
Units of measure similar at different levels	Units of measure may differ at different levels

FIG. 2
(Prior Art)

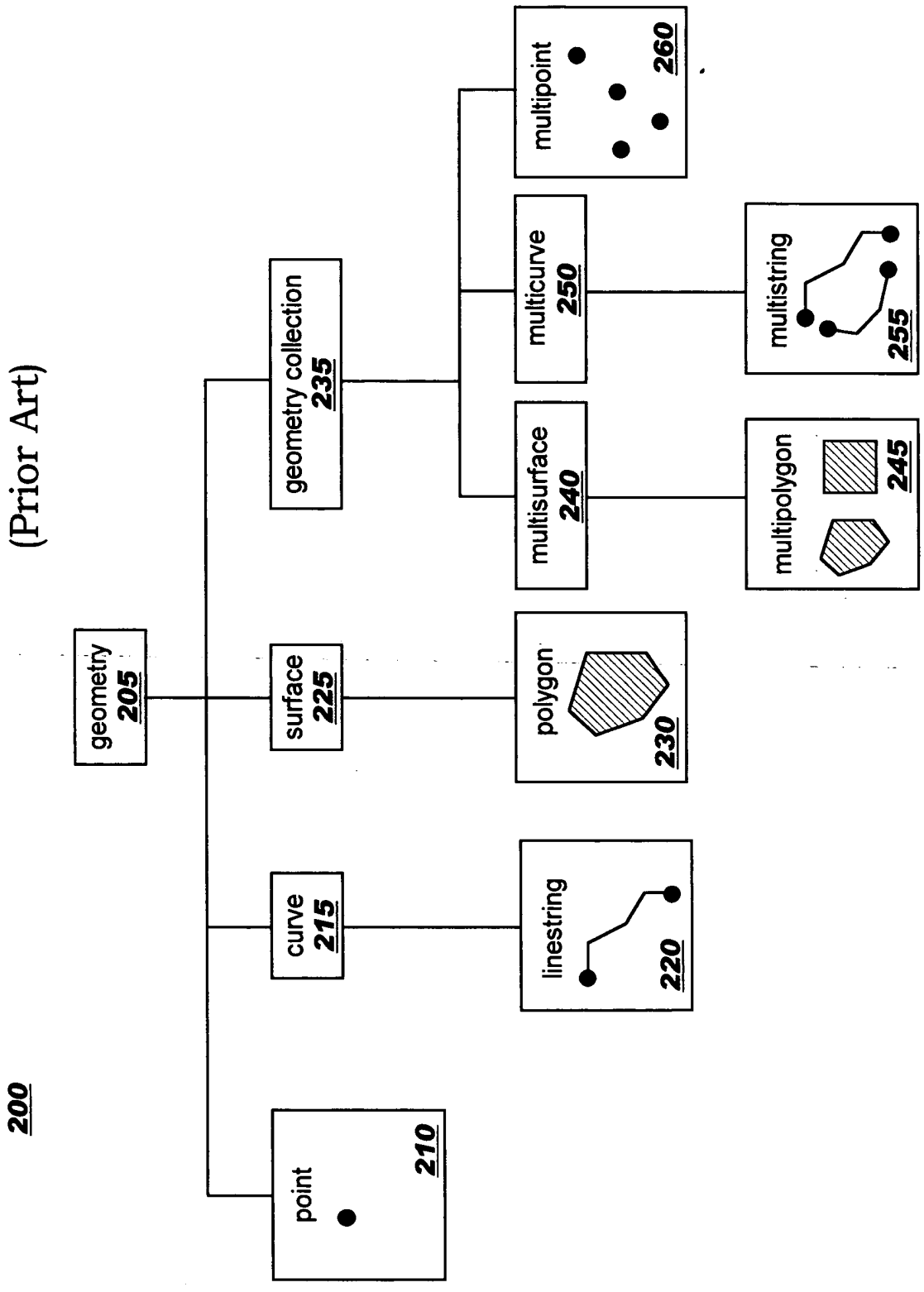


FIG. 3

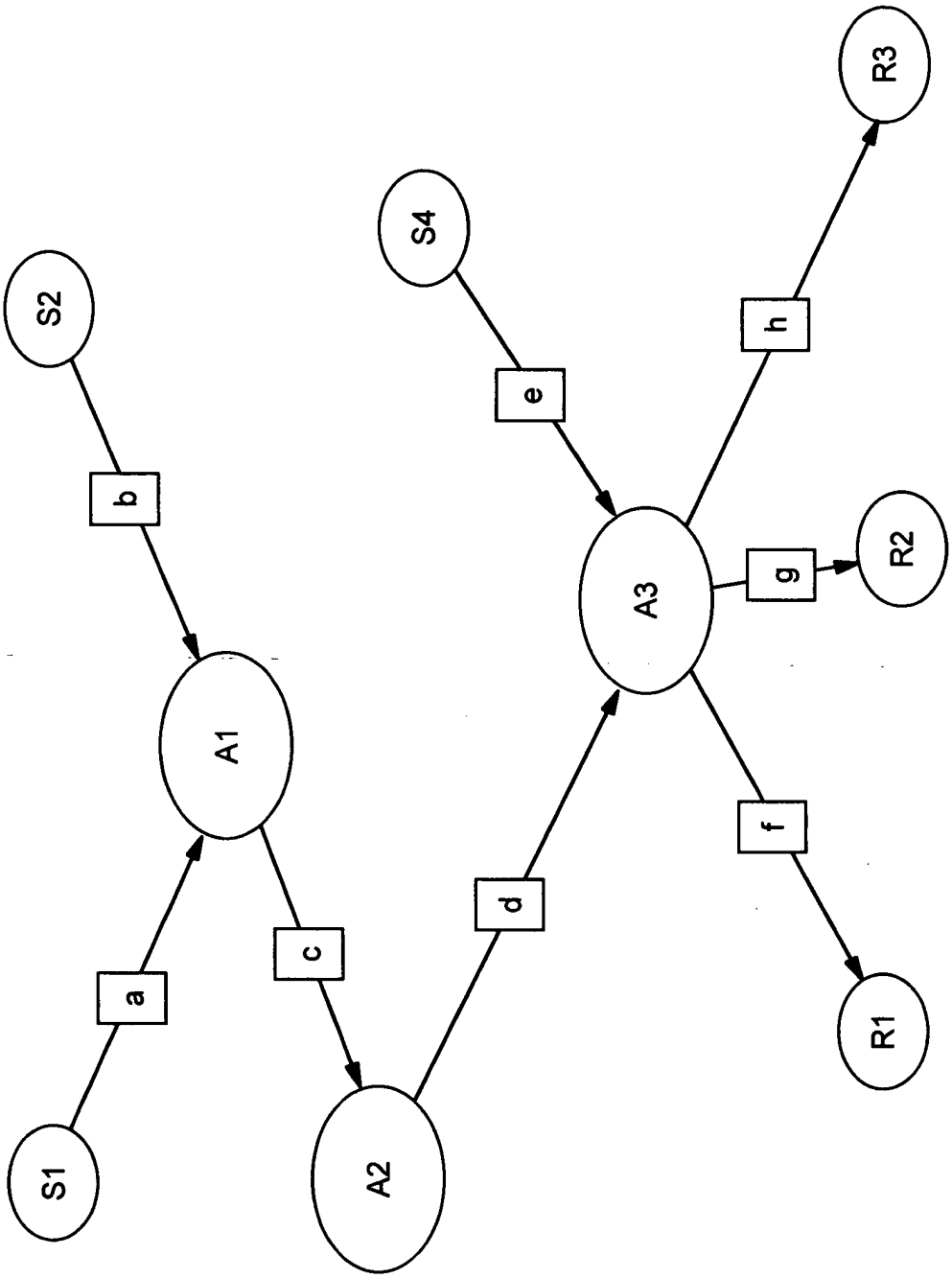


FIG. 4

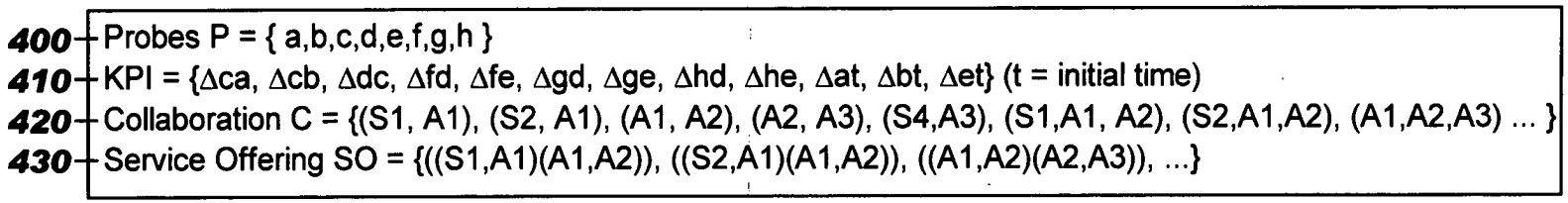

400
Probes P = { a,b,c,d,e,f,g,h }
410
KPI = {Δca, Δcb, Δdc, Δfd, Δfe, Δgd, Δge, Δhd, Δhe, Δat, Δbt, Δet} (t = initial time)
420
Collaboration C = {(S1, A1), (S2, A1), (A1, A2), (A2, A3), (S4,A3), (S1,A1, A2), (S2,A1,A2), (A1,A2,A3) ... }
430
Service Offering SO = {((S1,A1)(A1,A2)), ((S2,A1)(A1,A2)), ((A1,A2)(A2,A3)), ...}

FIG. 5B

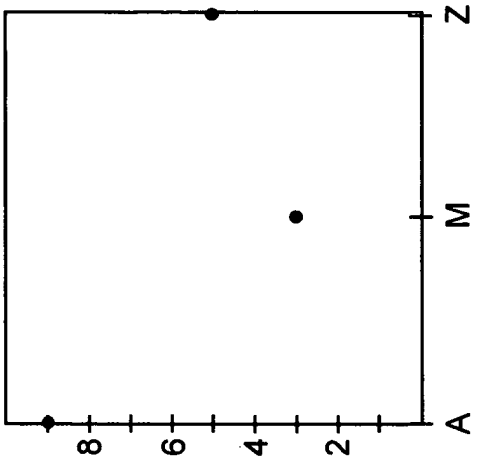


FIG. 5C

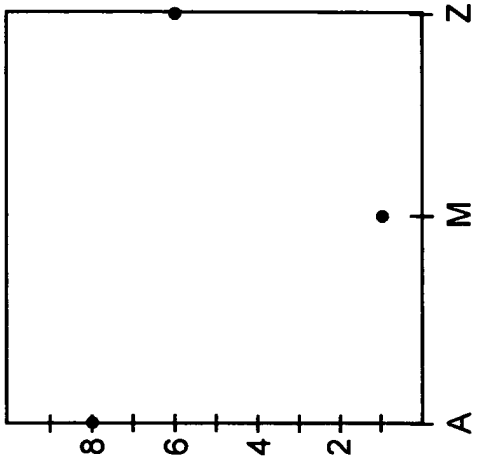


FIG. 5A

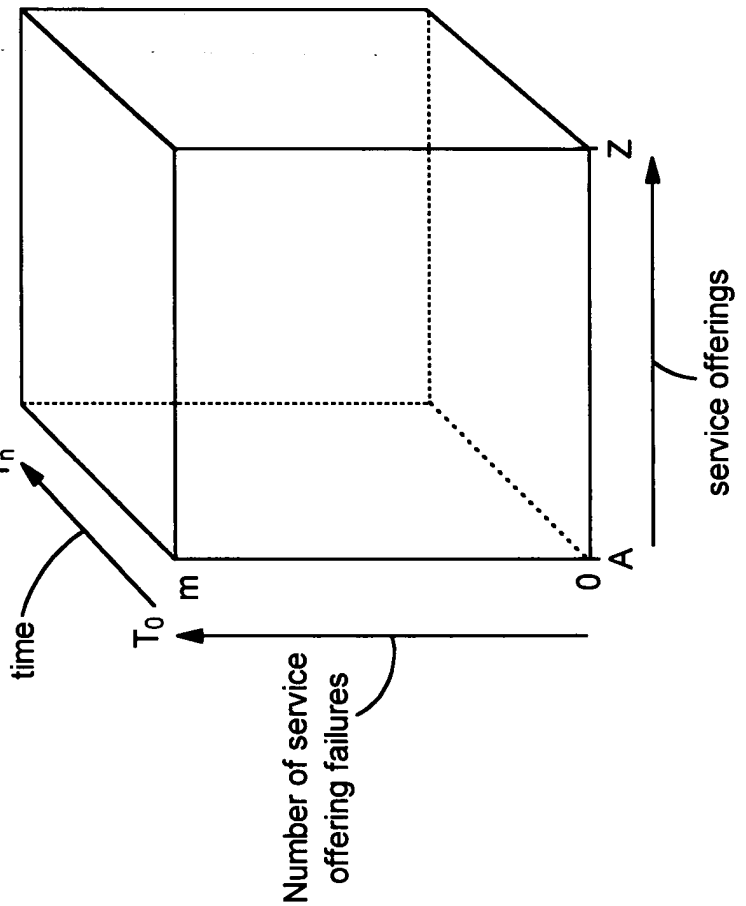


FIG. 6A

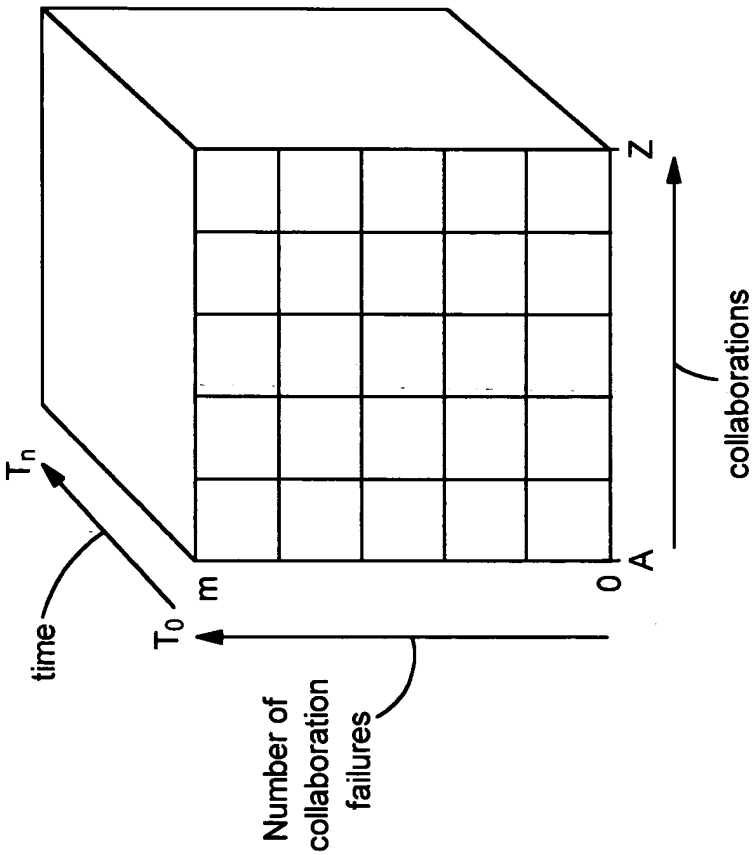

T_n
time
T_0
m
0
A
Z
collaborations
Number of collaboration failures

FIG. 6C

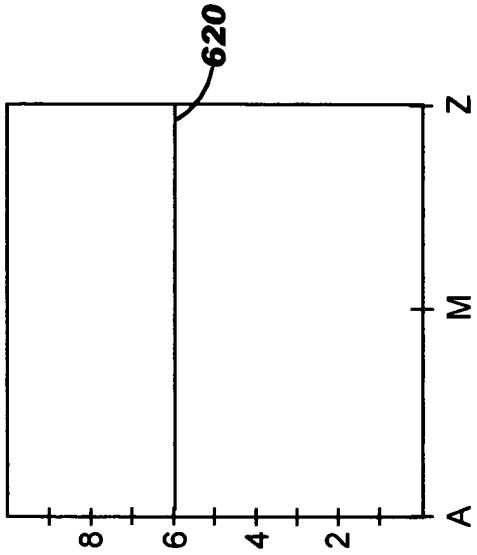


FIG. 6D

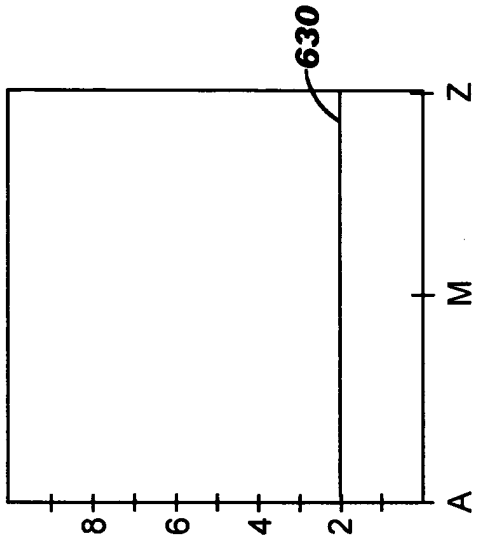


FIG. 6B

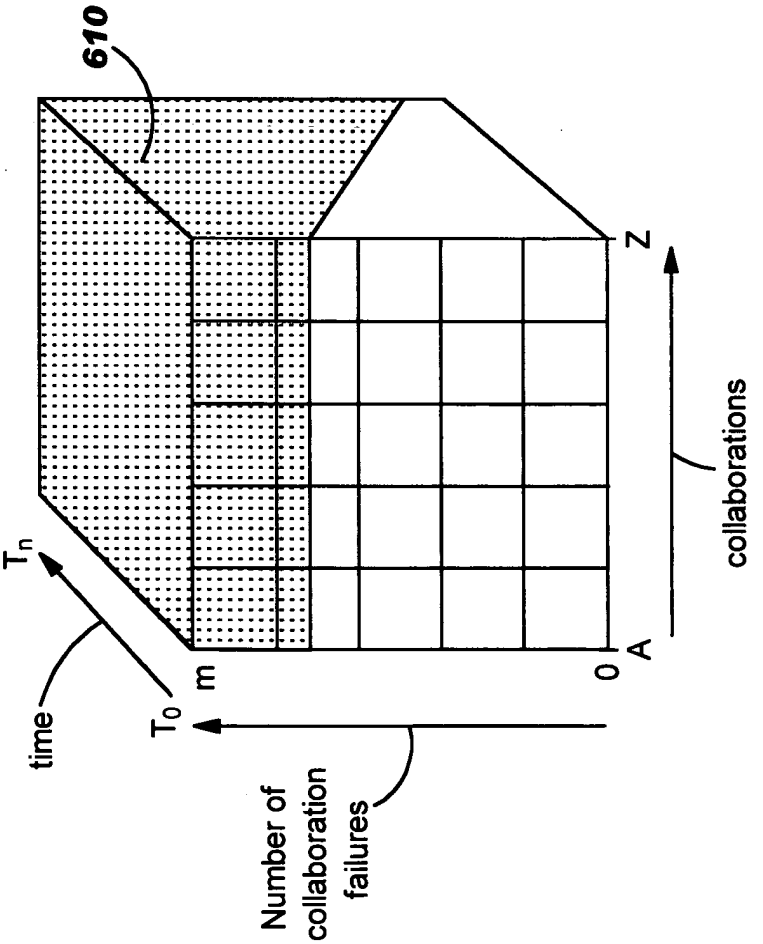


FIG. 7A

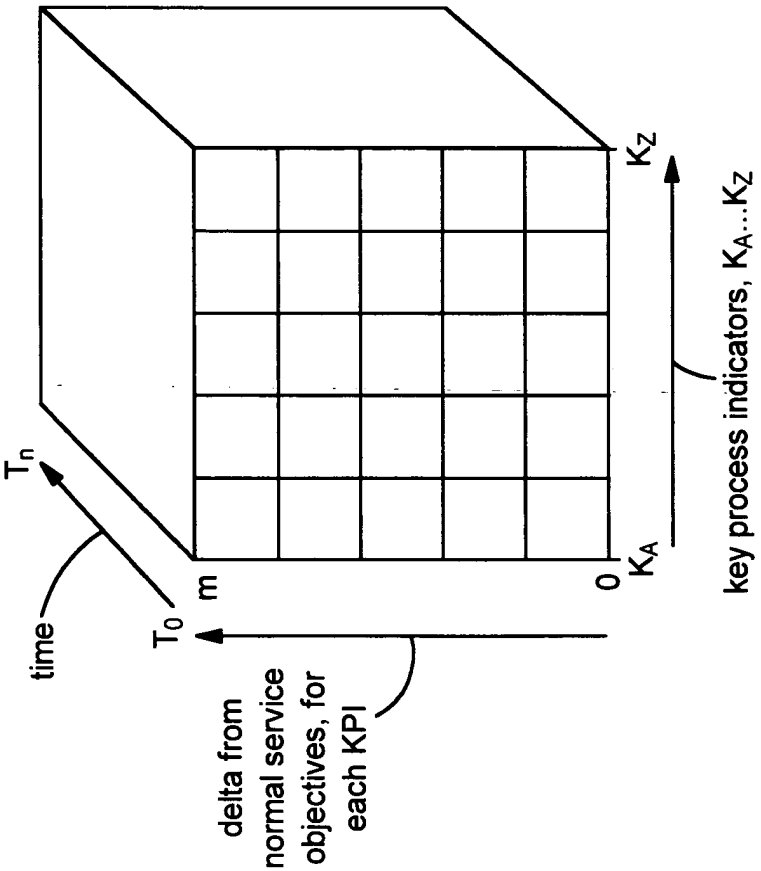

T_n
time
T_0
m
0
K_A
K_Z
key process indicators, K_A...K_Z
delta from normal service objectives, for each KPI

FIG. 7B

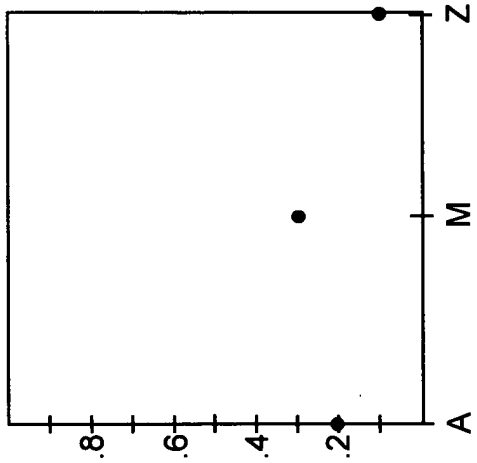


FIG. 7C

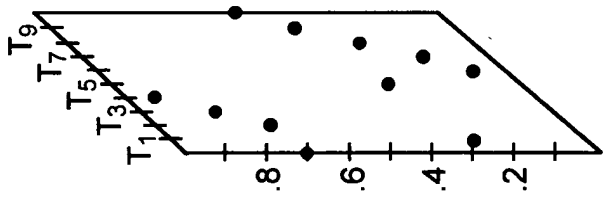


FIG. 7D

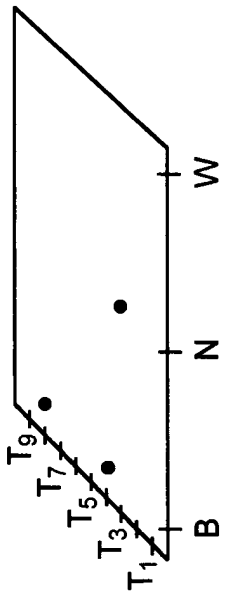


FIG. 7E

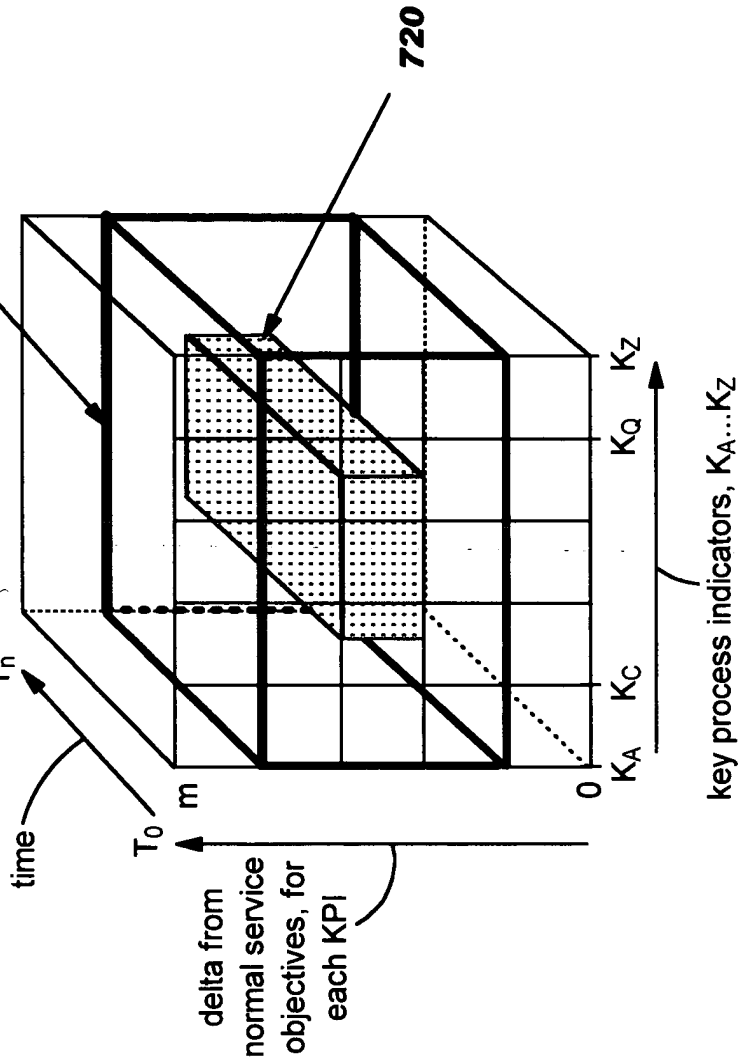

710
720
T_n
T_0
time
m
0
delta from normal service objectives, for each KPI
K_A
K_C
K_Q
K_Z
key process indicators, K_A...K_Z

FIG. 7F

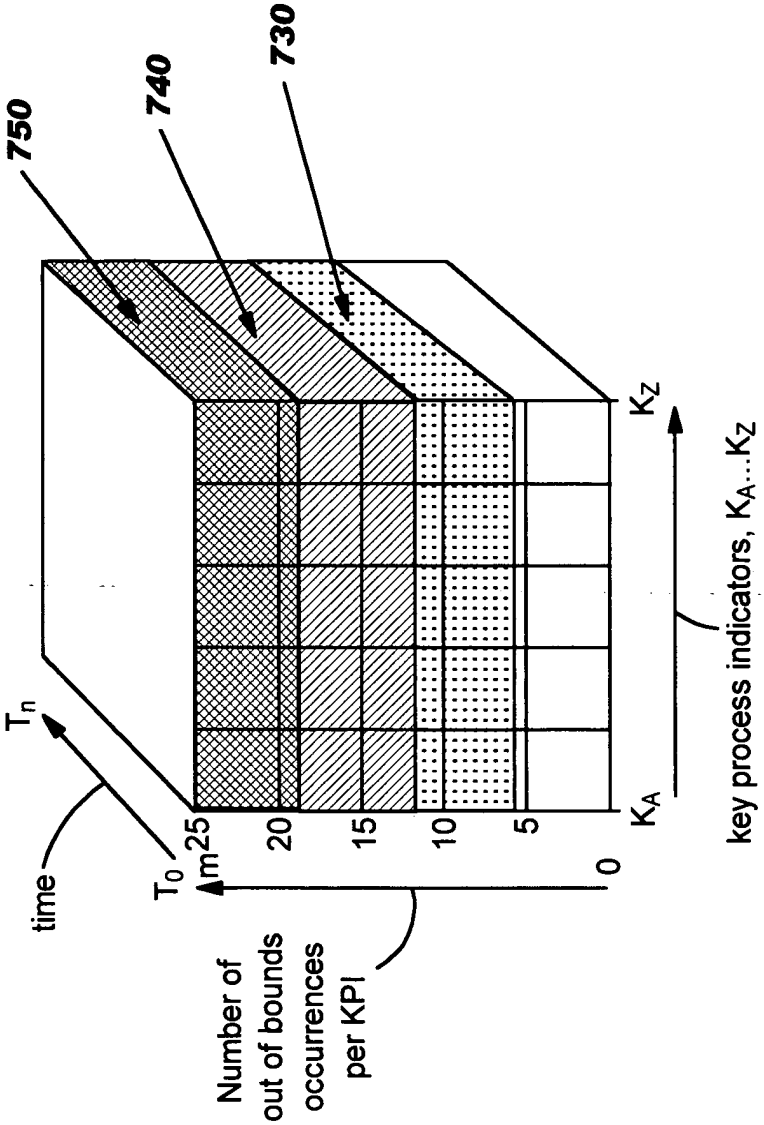

750
740
730
T_n
time
T_0
m
25
20
15
10
5
0
Number of out of bounds occurrences per KPI
K_Z
K_A
key process indicators, K_A...K_Z

FIG. 8A

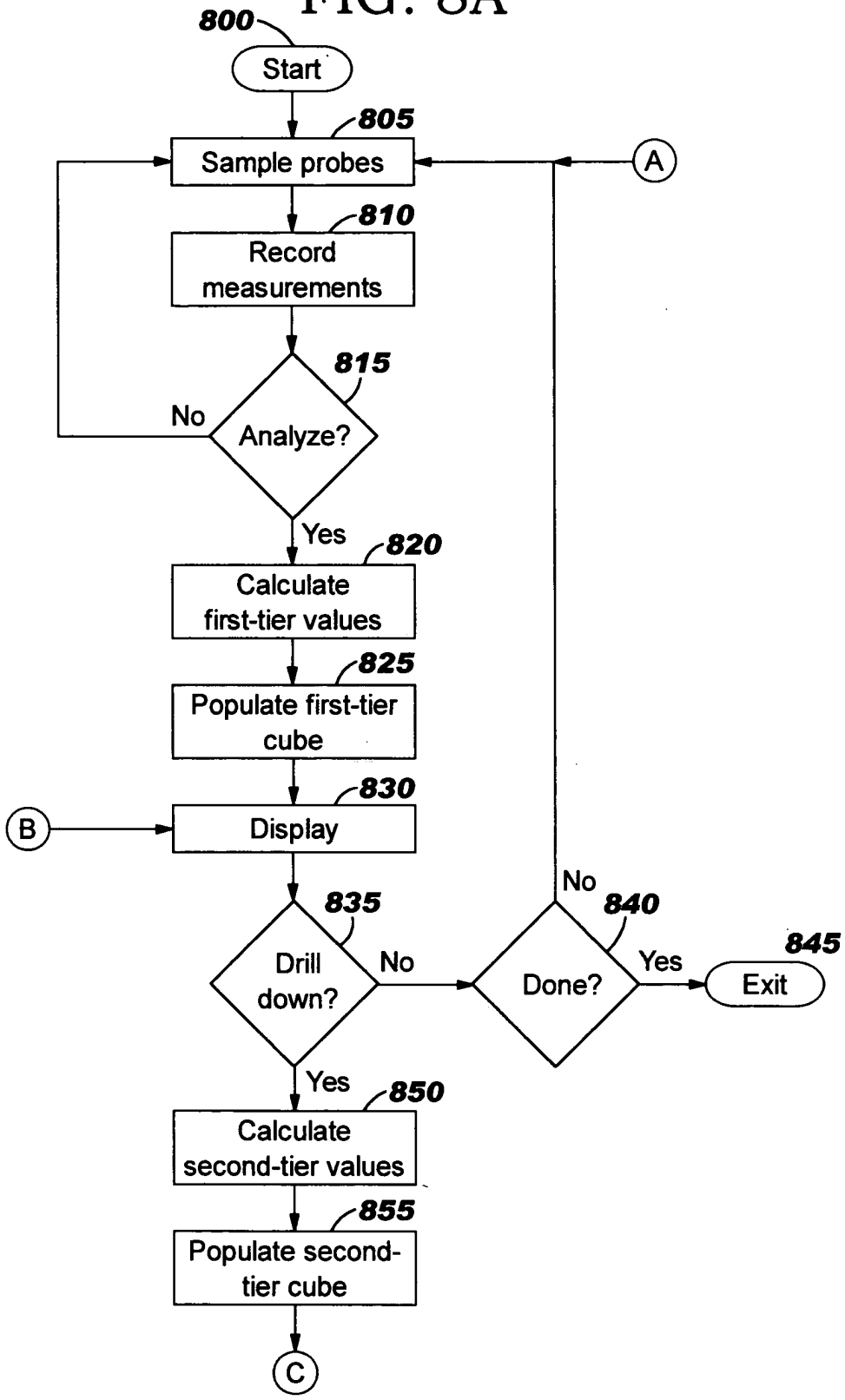
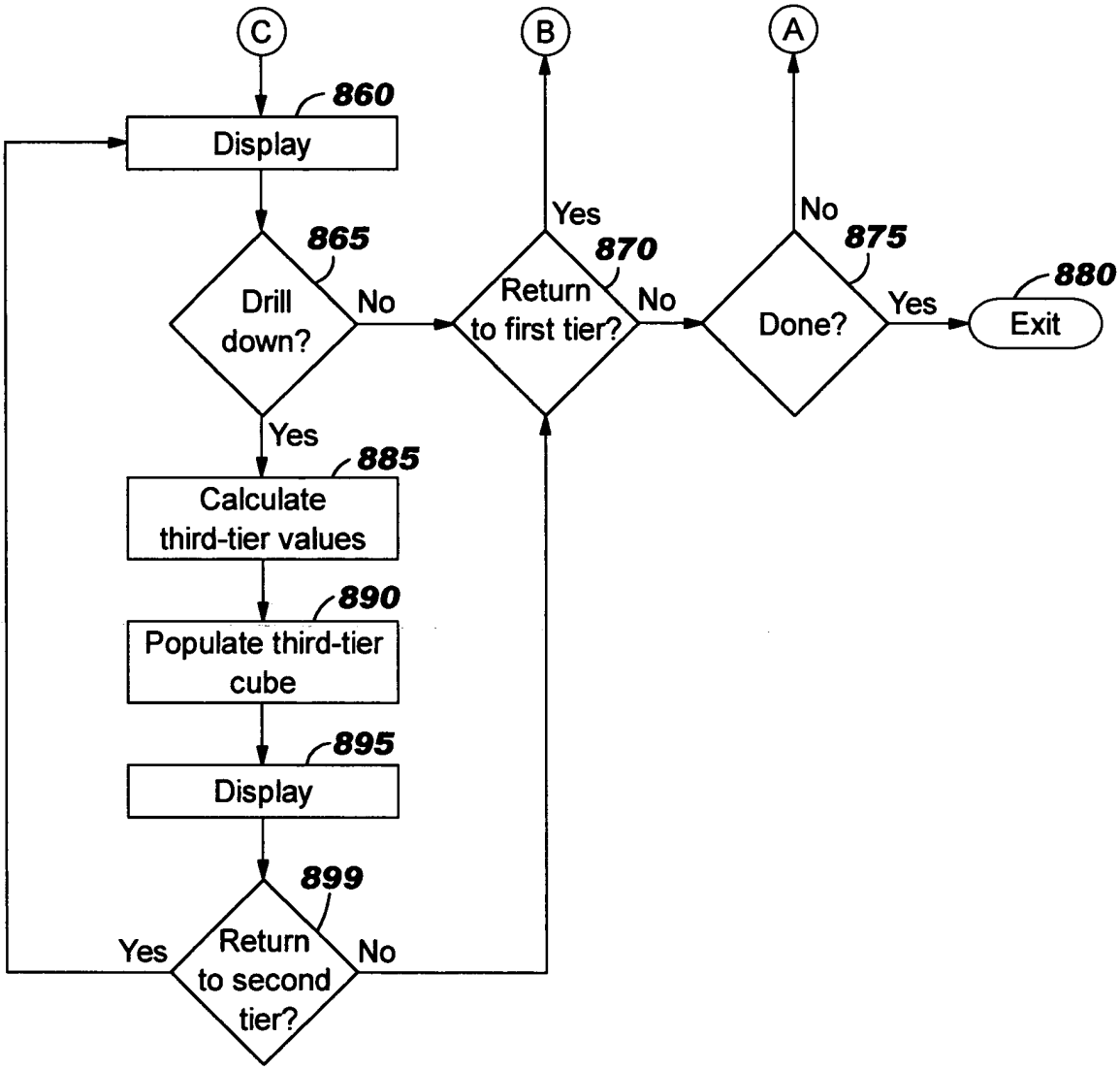

800
Start
805
Sample probes
A
810
Record measurements
815
Analyze?
No
Yes
820
Calculate first-tier values
825
Populate first-tier cube
830
Display
B
835
Drill down?
No
840
Done?
No
Yes
845
Exit
Yes
850
Calculate second-tier values
855
Populate second-tier cube
C

FIG. 8B


C
B
A
860
Display
865
Drill down?
No
Yes
870
Return to first tier?
No
Yes
875
Done?
No
Yes
880
Exit
885
Calculate third-tier values
890
Populate third-tier cube
895
Display
899
Return to second tier?
Yes
No